



Emerging Database Technologies

Duration : 04hrs

Detailed Syllabus

9.1 Database Server, Client/Server Platforms,
Distributed Databases

9.2 Data Warehousing and Data Mining

9.3 Open Systems, Interoperability, Database access
over Internet, Open Database Connectivity
(ODBC)



Database Server, Client/Server Platforms, Distributed Databases

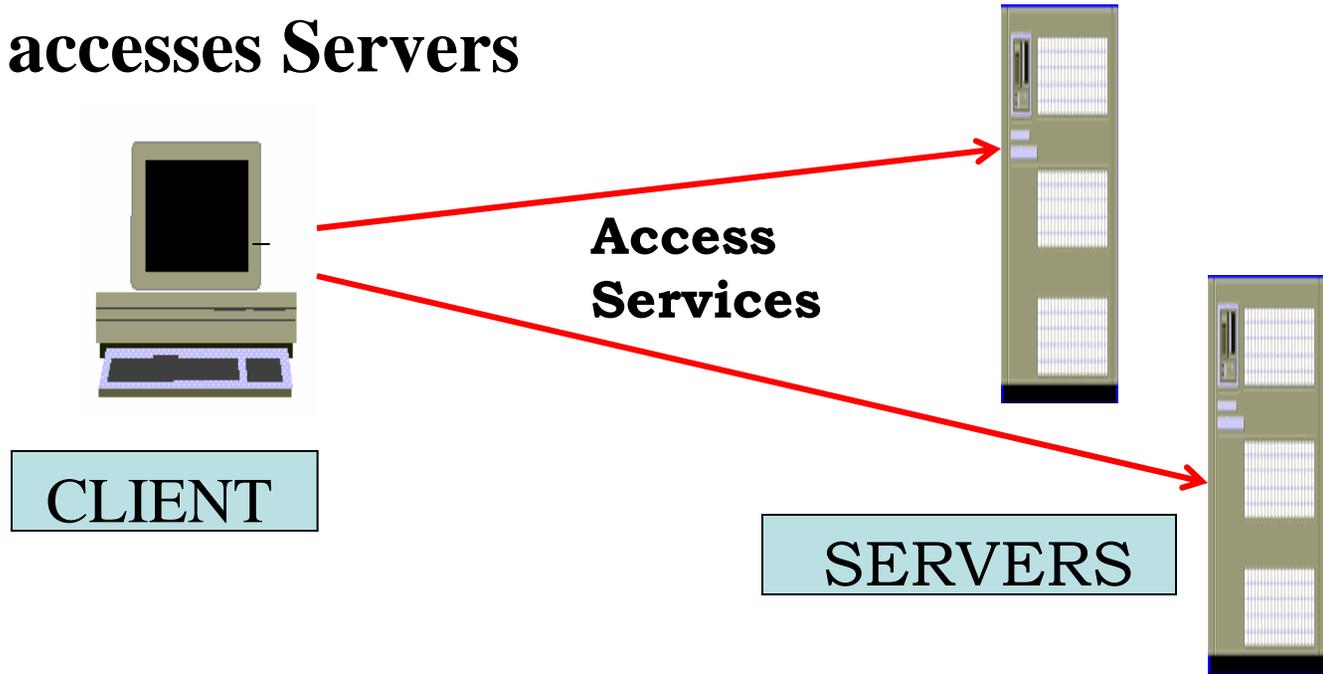
Client / Server Concepts

Applications are partitioned between Clients and Servers

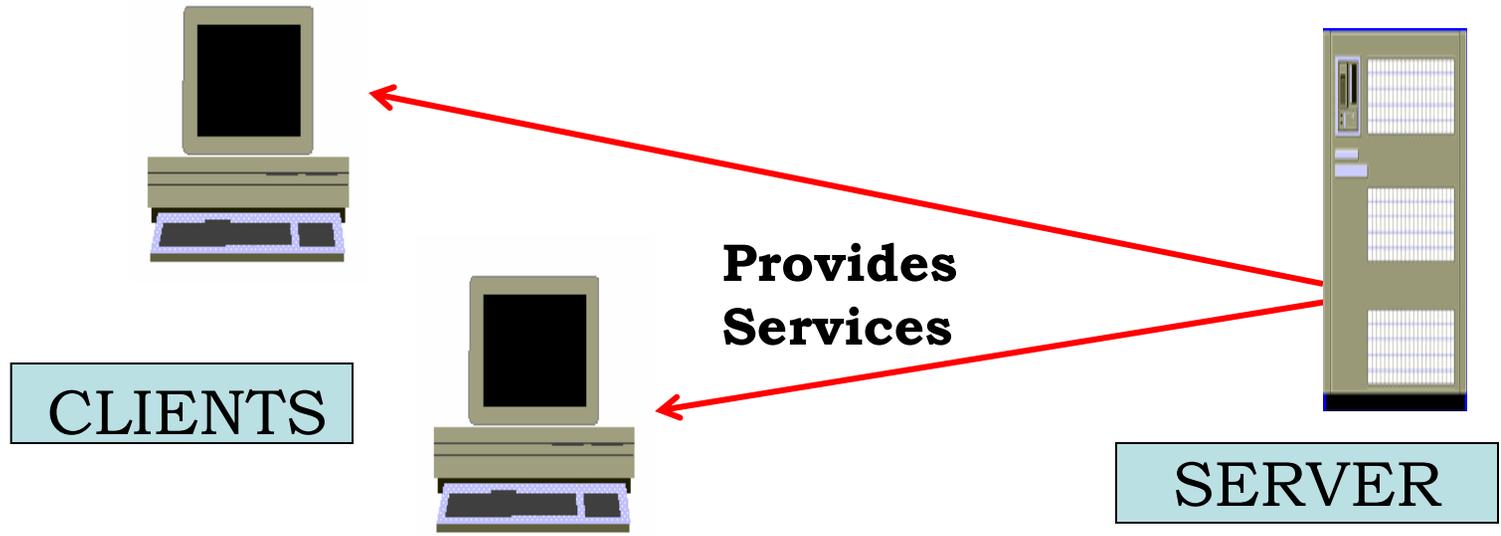
Client - *Access services provided by one or more servers*

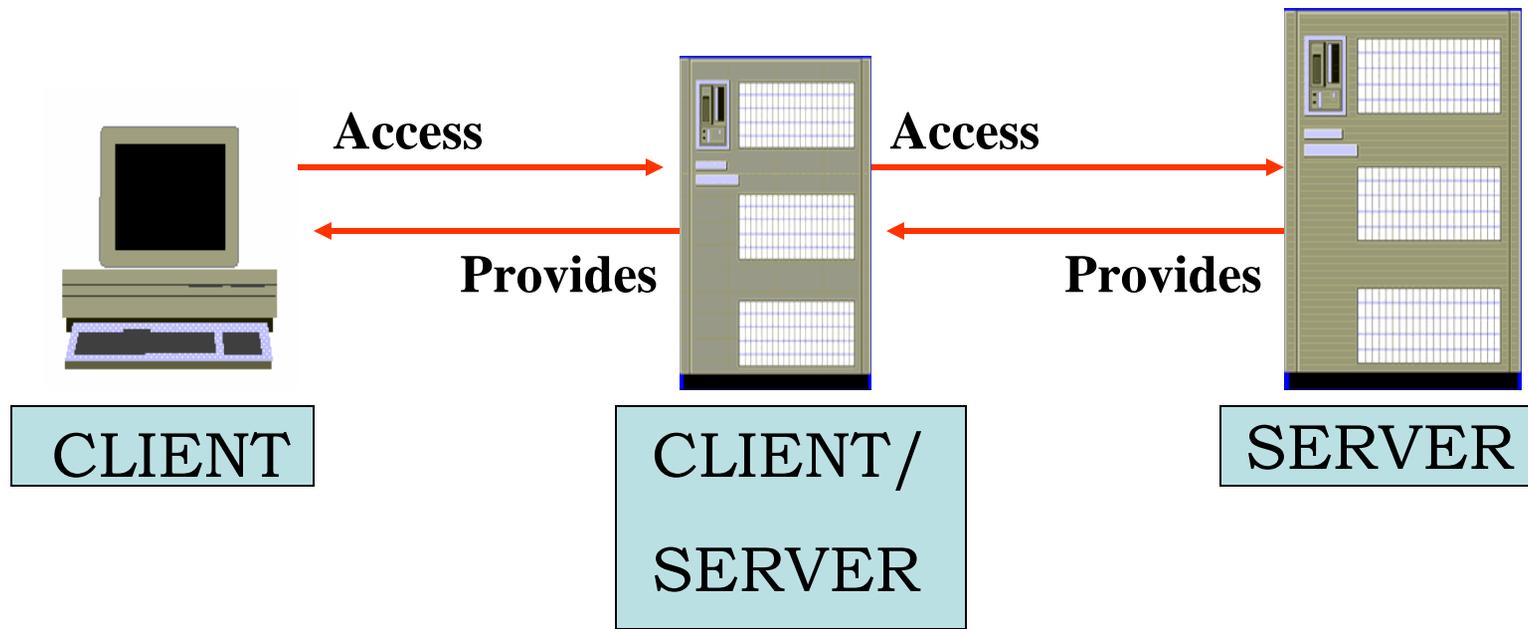
Server - *Provides services accessed by one or more clients*

Client accesses Servers



Server responds to Clients





One Computer can have both Clients and Servers executing on it.

Usually separate computers for clients and servers

C/S Architecture

contains two major components

- **Technical Architecture**
 - structured collection of computing technologies
(*h/w, o/s, service providing s/w*)
- **Application Architecture**
 - organization and location of s/w components
(*design*)

Technical Architecture

- Vary in Complexity
 - *fairly simple to very complex*
- Size of system measured by
 - number of users
 - transaction volume
 - geographical area

Common Components to Every C/S Technical Architecture

- Client
- Server
- Networks

Clients

- S/W only
- S/W and H/W Components

Usage

- Client Workstation

Client Workstation

Computer device at which user interacts with the client portion of a C/S application

Servers

Great variety of H/W and O/S

Usage : 3 common types

- File servers
- Print servers
- Database servers

File Servers

- Provides file sharing capabilities
- Users at several different clients can store and retrieve data in files on the disk drives connected to and managed by the file server

To the client

- File server's disk drivers are *Virtual disks*
- Client w/s access them across the network almost as if they were actually part of it.

Print Servers

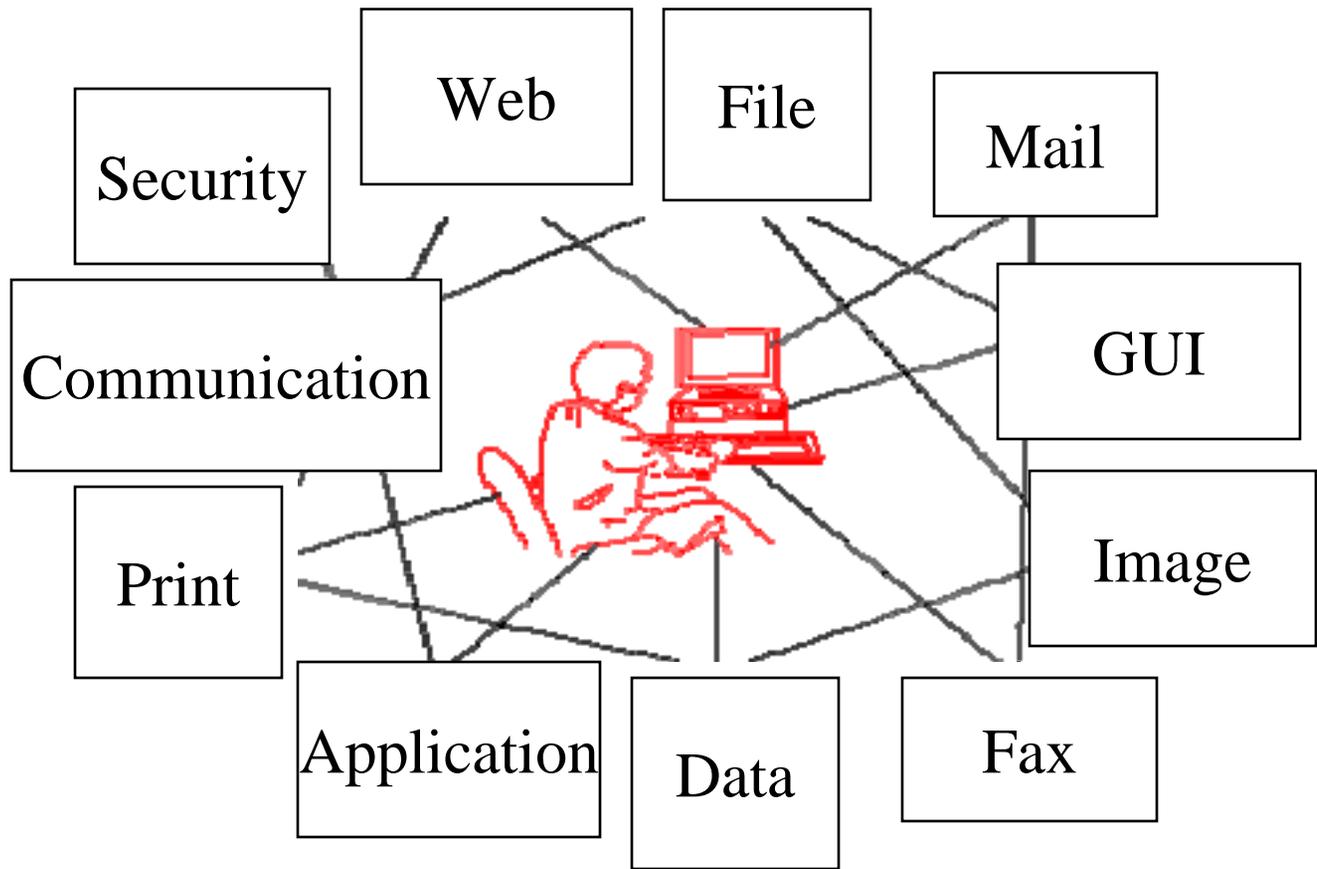
- Allows to share printers.
- Printers connected to and managed by a print server can be accessed across the network by a client w/s almost as if they were directly connected to it.

Database Servers

- manage one or more or databases
- most applications are built using a database as a DBMS provides a mechanism for managing **multiple user access** to a **set of structured data**.

DBMS usually based on the relational database model support a version of SQL for retrieving and manipulating the data in the database

Other Usage



Capability

Network bandwidth.

Sufficient memory.

Powerful processors.

Technical Architecture must have appropriate technology components to provide any of the above facilities

Server H/W

- Powerful PC
- Mini computer

Server O/S

- Multitasking O/S
OS/2, Windows NT, Unix

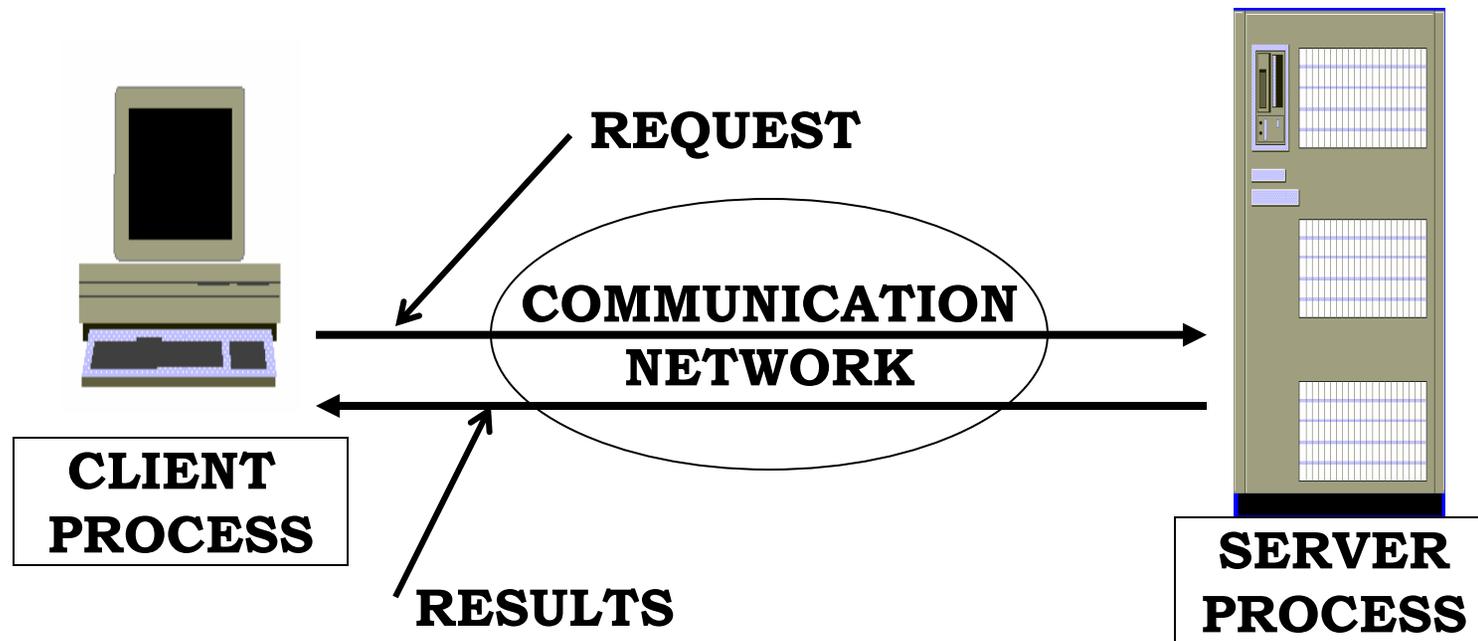
Networks

Collection of H/W and S/W services that enables computers connected to it to communicate with each other.

- Networking S/W configured into their O/S so they can send information over the network using well defined protocols and message formats.

Putting it together (C/S Technical Architecture)

The basic components (H/W, O/S, S/W) just described are combined to form the foundation of a Client/Server Technical Architecture



Fairly simple C/S Technical Architecture

- few users
- high performance PC servers used as
 - file servers
 - database servers
 - Network O/S

Usual

- dedicated database servers.
- often a version of UNIX

Very Complex

– Many O/S

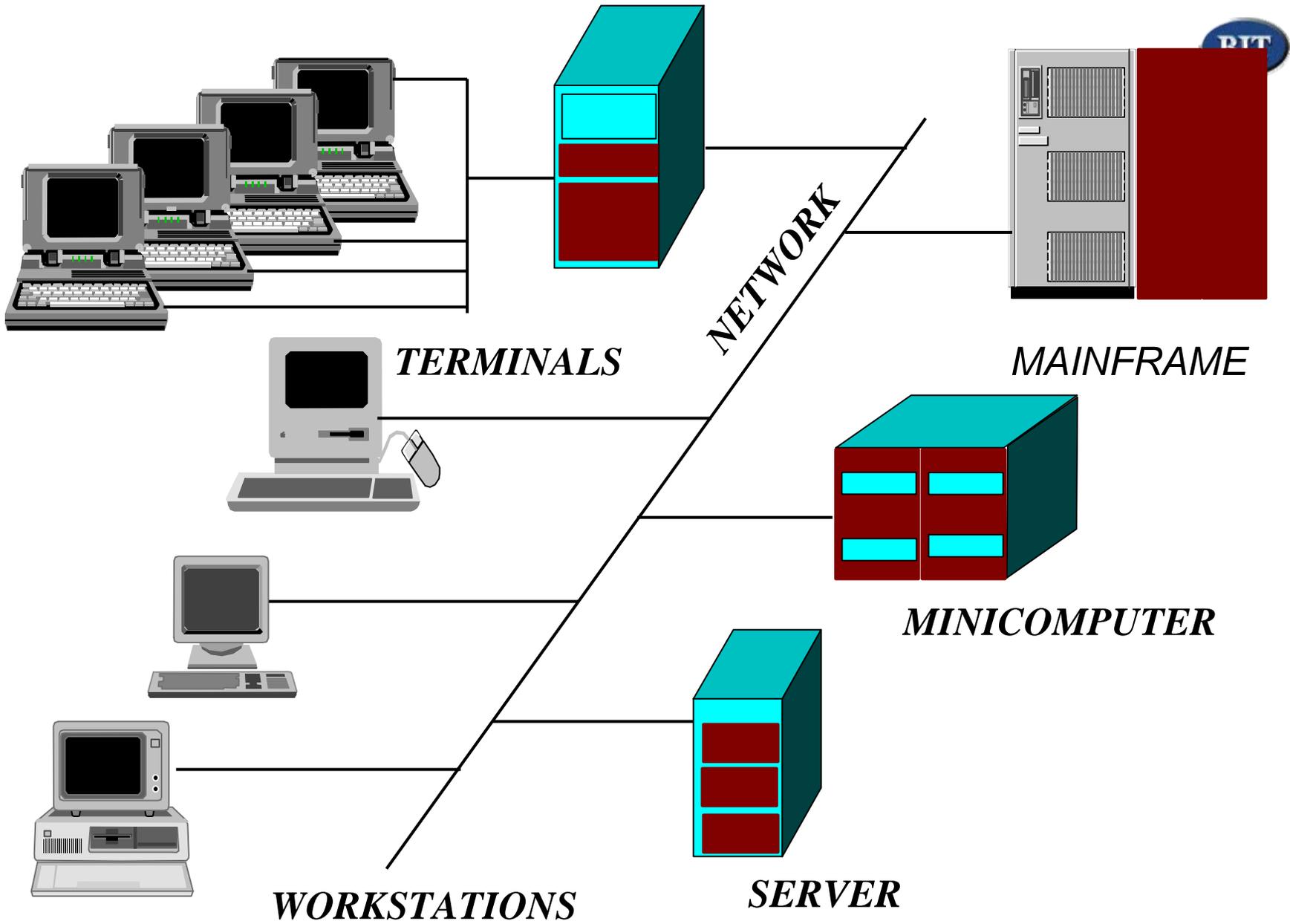
MVS, OS/400, VMS a Unix variant or two,
perhaps a real-time O/S and one of the
3 main Network O/S

But ...

*most exist in an isolated environment or
tied to the rest by way of file transfer facility*

Required is

interactive ties between different environments



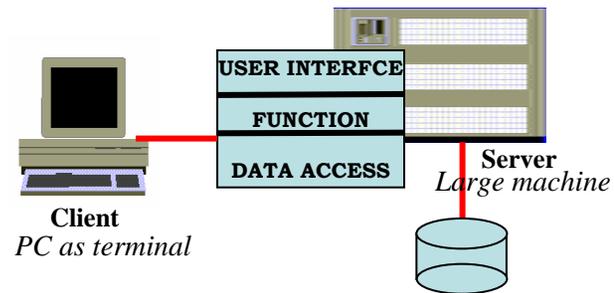
Very Complex Client/Server Architecture

Application Architecture

Four fundamental configurations

- Single computing system
- User interface distribution
- Data access distribution (two-tier)
- Function distribution (three- tier)

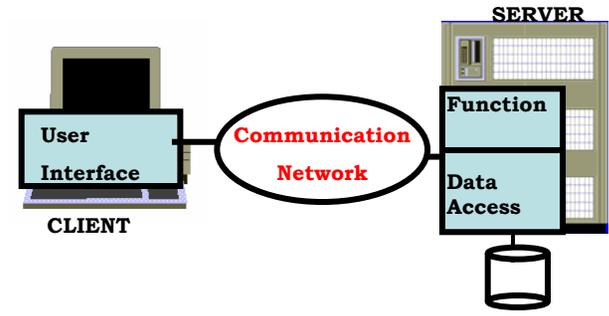
Single Computing System Model



All in one place

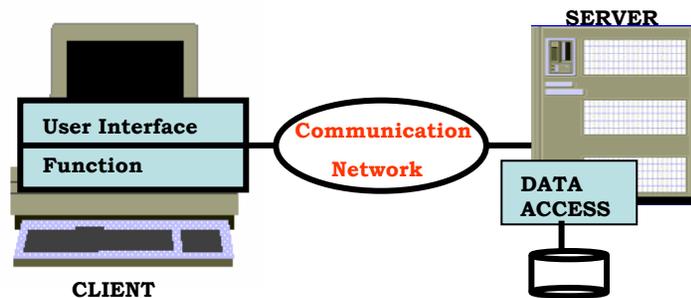
most computing during the past

User Interface Distribution Model



Data Access Distribution Model

two-tier



- data distribution
- data in different machines
- database servers used

Two - tier

two processing tiers or locations
where the application where execute

- Client Workstation and
DBMS server

Client portion of the application

- allows users to enter data
- submit requests to retrieve data from the database
- summarize and display data in various ways

Client application code

- interprets the user's inputs
- translate them into SQL statements
- transmits the SQL across the network to the database server

Server application code (DBMS)



- actual insertions of new data
- updates to existing data
- retrievals of data in response to a query from a client W/S
- In case of query, prepares the return set of requested data and transmits it back across the network to the client application code on the appropriate W/S

Servers Applications

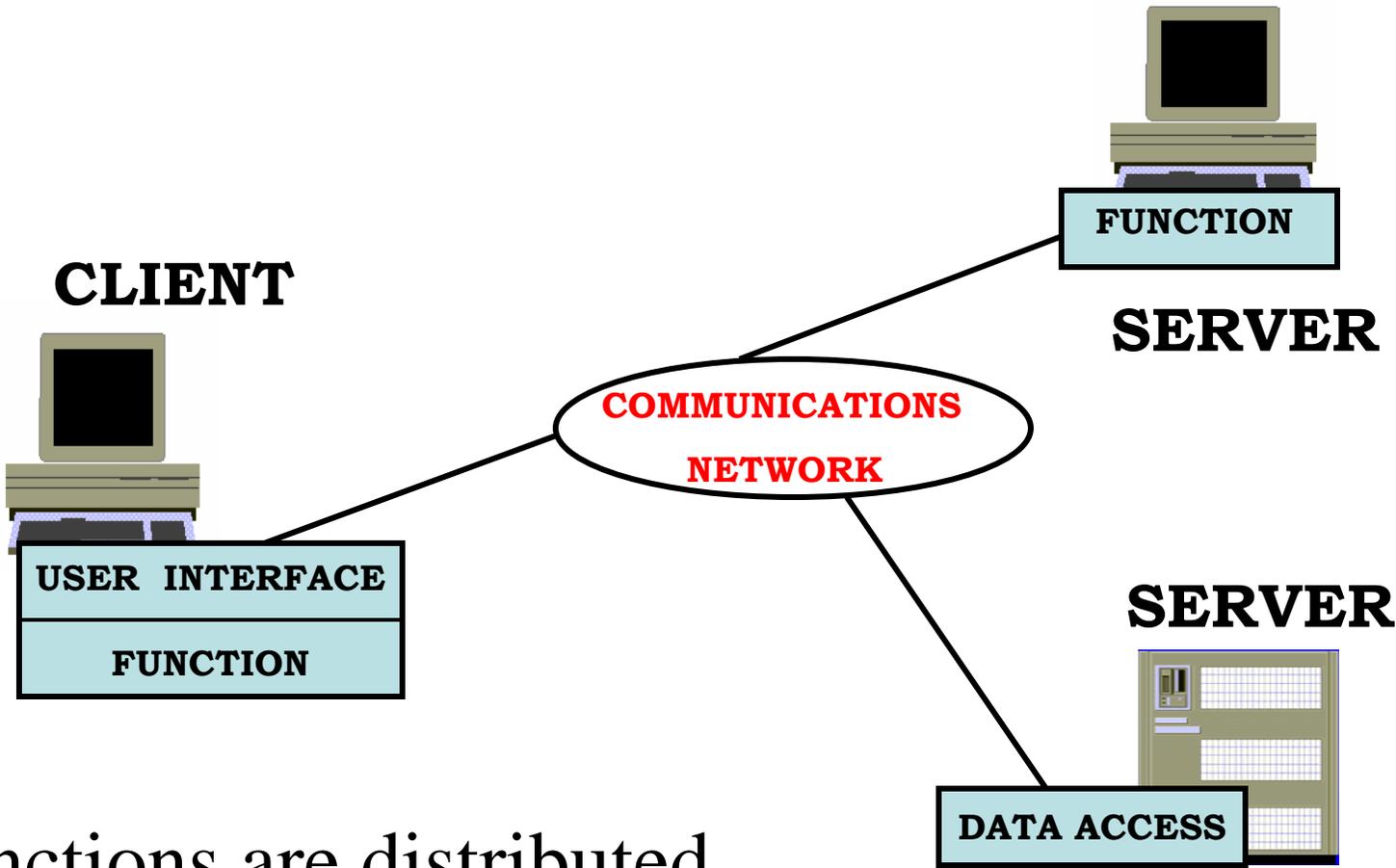
- manipulate large sets of data
- perform a series of complex calculations

Client Applications

- interpretive 4GL in a Windows environment

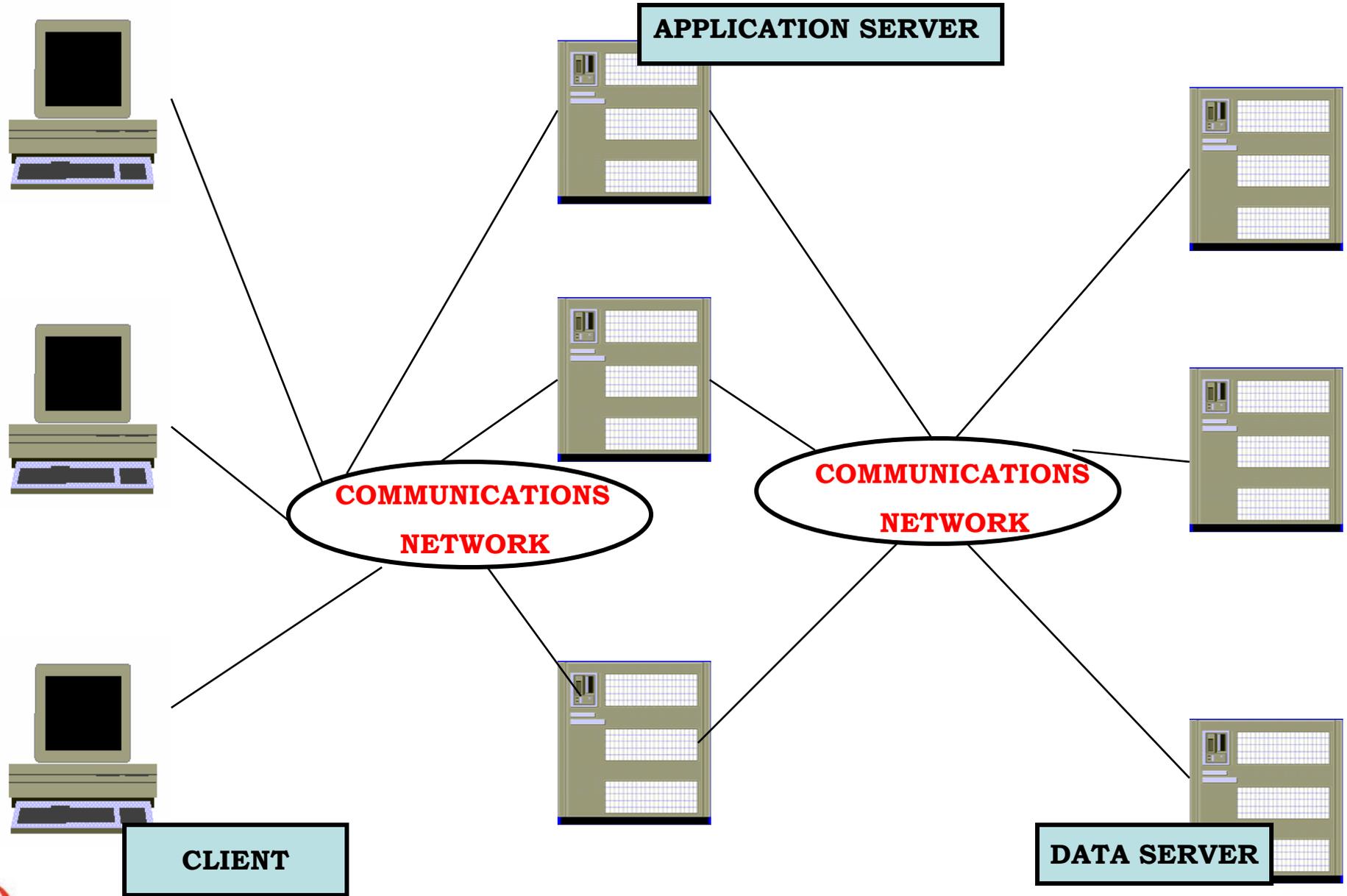
Function Distributed Model

Three-tier



Functions are distributed

Multi-tier



Correct Architectural Solution

depends on

- » Problems to be solved
- » Organization that must solve it
- » Platform to be used
- » Tools available

*This gives more options to the designers
but makes selecting the final architecture more
difficult*